

Attorney Docket No. 1033033-000028

In re Patent Application of

Group Art Unit: 2856

Examiner: HELEN C KWOK

Confirmation No.: 5265

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Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Applicant appreciates the courtesy extended to the Applicant's representative during the November 7, 2007 telephone interview. The substance of the discussion is provided below.

Neither the Waschgies nor Gunkel patents disclose or suggest a method for evaluating a welding joint as the welded joint is forming wherein sound is transmitted with longitudinal and transverse ultrasonic waves into a region of the welded joint as recited in Applicant's independent claim 1. Such a feature encompasses Applicant's exemplary embodiment as illustrated in Fig. 1a wherein two flat metal sheets 1, 2 of a joint are in contact and form a metal sheet/metal sheet contact, B-B. For energy input to form a temperature dependent welded spot between the two parts 1, 2 of the joint, welding electrodes 3, 4, are respectively placed on the corresponding sides of the metal sheets to create an electrode/metal sheet contact, E-B as disclosed in Applicant's specification at page 9, the paragraph beginning at line 18. The inferior indices i and t of the mathematical equations 1 and 2 indicate the sound transmittance through the individual contacts of the longitudinal waves (l), and respectively transverse waves (t).

The Waschkies patent discloses a process for assessing welded joints using transverse ultrasonic waves.

As disclosed in the Gunkel patent, at the paragraph beginning at line 66 of column 6, boundary zones of a weld are defined as the zones adjacent the I.D. and O.D. boundaries between the weld and adjacent plate. The heart of the weld is labeled as H. In the Gunkel patent, a specific inspection of the I.D. and O.D. boundary zones Z_{ID} and Z_{OD} is provided by shear wave inspection simultaneously with inspection of the heart of the weld and plate adjacent the weld by longitudinal wave inspection. The Gunkel patent uses a combination of types of ultrasonic inspection to provide inspection. The Gunkel patent clearly discloses that the zones Z_{ID} and Z_{OD} are evaluated by shear inspection, wherein the heart H is evaluated by longitudinal wave inspection. The Gunkel patent does not perform inspections of a welded joint as it is forming and instead discloses the inspection of already formed welds.

Claim 3 recites

$$\frac{D_i(t)}{D_r(t)} = \frac{(EB)_i(t) \cdot (BB)_i(t) \cdot (BI)_i(t) \cdot (BE)_i(t)}{(EB)_r(t) \cdot (BB)_r(t) \cdot (BI)_r(t) \cdot (BE)_r(t)} \approx \frac{(EB)_i^2(t) \cdot (BB)_i(t)}{(EB)_r^2(t) \cdot (BB)_r(t)} \approx \frac{(BB)_i(t)}{(BB)_r(t)}$$

with $(EB)_{i \text{ or } r}(t) \equiv$ sound transmittance of longitudinal waves or transverse waves at the sound coupling - in area on the first part of a joint

$(BB)_{i \text{ or } r}(t) \equiv$ sound transmittance of longitudinal waves or transverse waves at the contact between the parts of a joint

$(BI)_{i \text{ or } r}(t) \equiv$ sound transmittance of longitudinal waves or transverse waves inside the parts of a joint

$(BE)_{i \text{ or } r}(t) \equiv$ sound transmittance of longitudinal waves or transverse waves at the sound coupling out area on the second part of a joint

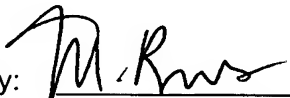
with $(BI)_{i \text{ or } r}^2(t)$ and $(EB)_{i \text{ or } r}^2(t)$ of the longitudinal waves and the transverse waves being largely the same provided that frequencies are low and the transmission paths are short. These features are not disclosed or suggested by the Waschkie or Gunkel patents either alone or in combination.

The Examiner agreed to take the Applicant's arguments into consideration prior to issuing the next Office Action.

Respectfully submitted,

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